

CUTEC NEWS

FACTS · INFORMATION · ANALYSES

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February 2005

Silently falls the snow, ...



... still and frozen lies the lake. You are probably familiar with this and other Christmas carols which could be heard just about everywhere during the past weeks. For me, Christmas carols belong to the Advent season every bit as much as candlelight, home-baked biscuits, and hot mulled wine. All are intended to prepare us for the Christmas celebration, to help us forget the hustle-and-bustle of everyday life, and put us into a more contemplative mood. The long evenings during the weeks before Christmas also provide an opportunity to relax and reflect on the events of the preceding months in retrospect.

Without a doubt, the past year too was not an easy one for many companies from an economic standpoint. Of course, the increasing unemployment in Germany presents a serious problem, not only for big business. It also affects small and medium-sized enterprises, whose contribution to the country's economic strength is quite substantial. After all, some 75 per cent of the nation's work force are employed at medium-sized enterprises. To a large extent, innovations provide the driving force for the maintenance of existing and especially the creation of new jobs. Regardless of whether they are engaged in politics or in the economy, all participants must be aware of this fact. Even a cut-back by a relatively modest sum of 10 million Euro at the *Arbeitsge-*

meinschaft industrieller Forschung (AiF – Working Association for Industrial Research) in a single year, for instance, would prevent the initiation of 100 new innovation projects which could boost our economy in the short and medium term.

For CUTEC itself, 2004 proved to be a good year. The acquisition of third-party funds has increased, and even the job inventory for 2005 is quite substantial. Additional personnel have been employed. For the first time, we have also created several traineeships in 2004, and our trainees are highly motivated because they know what to expect in the future – this fact should be noted at this point in spite of all the belly-aching. On the regional level, the competence cluster Harz has been established as part of the *Landesinitiative Brennstoffzelle* (Fuel Cell Initiative in Lower Saxony); its purpose is to concentrate the scientific activities in this field in Lower Saxony. Right on the CUTEC premises, the installation of the pilot plant for the synthesis of fuel from biomass – ArtFuel – has been practically completed. This facility is directly associated with a number of interdisciplinary research projects at our company

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with the objective of generating a comprehensive database for the process chain. I also wish to mention our Institute Report, which was completed at the end of the summer and which covers a wide variety of projects executed during the past four years. If you have not yet received a copy of this report, please notify us. We shall send you a copy immediately.

Yours, Otto Carlowitz

Nigerian Ambassador visits CUTEC Institut GmbH

CUTEC-Institut GmbH maintains a good relationship since 2000 with the Nigerian Embassy in Germany. Hence, the Embassy is aware of CUTEC's capabilities and diver-

sified fields of operation in the environment sector both for developing and developed nations of the world.

The new Nigerian Ambassador to Germany, Prof. Tunde Adeniran, a renowned Nigerian academic and former Nigerian Minister for Education paid an official visit to CUTEC on 23rd August 2004 to enable him have an in-sight in the institute's environmental operations and level of interest and cooperation in Nigeria. CUTEC's Managing Director, Prof. Otto Carlowitz and his top managers warmly received the Ambassador and his then Counsellor, Mr. Aniefiok Johnson, at the CUTEC facility.

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CUTEC team welcomes Ambassador Prof. Tunde Adeniran (left)

Progress with the ArtFuel project

Pilot plant for the production of synthetic fuels from biomass nearing completion

On 11th December 2002, the Ministry of the Environment in Lower Saxony placed an order with CUTEC for the construction of a pilot plant for the synthesis of fuels from biomass (see the initial report in CUTEC News, 1 / 2003 issue). The intention is to utilise the experience and equipment available in Clausthal for simulating the entire process chain from thermal decomposition through gas purification, Fischer-Tropsch synthesis, hydrocracker, and post-treatment, all the way to the motor test stand. The technology had to be designed to provide research possibilities with a high degree of variability as well as efficient analytical techniques. Because of the extremely complex plant technology, external manufacturing and supplier services

were also necessary, in addition to the CUTEC workshop, including designing and construction. In the course of the elaborate tendering and awarding procedure, plant components were ordered from a total of 35 different companies. Furthermore, many smaller parts were ordered from various suppliers. Companies such as T & M Engineering (detail engineering), LINN High Therm (electrical accessory heating), and Vogel Automatisierung (electrical and process control technology) deserve special mention. The elaborate project management was assumed by CUTEC. On 15th November 2004, the gasifier and the exhaust gas purification unit, including the accessory systems, were completed under the direction of the

Department of Thermal Processes. The main plant is shown in the figure. Research activities will begin in the course of follow-up projects. (vd)



The ArtFuel plant in the north hall

CUTEC opens an office of the *Landesinitiative Brennstoffzelle Niedersachsen* (Fuel Cell Initiative in the Federal State of Lower Saxony)

Competence Cluster Harz (located in the Harz Mountains) is occupied with science and with SOFC development

Fuel cell technology is developing into a key technology. For enhancing the chances of the Lower Saxon economy in the future, the State Government started a corresponding initiative in April 2004. This initiative is sponsored by the Ministries for economics, for science, and for environment. Objectives include to open the potentials for future value creation in Lower Saxony, to expand the research activities, to strengthen decentralised power supply structures, and to promote cooperation among economy, science, and politics.

In the Fuel Cell Initiative in Lower Saxony, the representatives from the economics, science, and politics have set the following objectives:

- ❑ Definition of success-oriented primary topics in fuel cell technology for Lower Saxony as orientation for the state's promotion strategy in that area
- ❑ Declaration of promotion recommendations on the basis of submitted project proposals
- ❑ Decision on strategy and participation in industrial fairs
- ❑ Positioning of the Lower Saxon initiative in kompetenznetze.de

Three competence clusters (Oldenburg, Wolfsburg, Harz) will channel the expert knowledge in Lower Saxony for important fields of application in fuel cell technology.

The substantial participants in the competence cluster Harz are the H. C. Starck GmbH in Goslar, the Technical University of Clausthal (with to time eight institutes, represented by Professors Beck, Borchardt, Carlowitz, Endres, Kunz, Langefeld, Maus-Friedrichs, Schmidt, and Wesling), as well as CUTEC. The members of the competence cluster's executive committee are Dr. Gille (H.C. Starck), Prof. Beck (IEE), and Prof. Carlowitz.

CUTEC was assigned with the establishment of the office of the competence cluster Harz.

The cluster will contribute to the success of the initiative and is concentrated on the following tasks:

- ❑ consolidating the present competences at the research institutions of Lower Saxony in the field of fuel cell technology to form a network,
- ❑ catalysing cooperation between science and the economy with the aim of identifying the potential present in the Lower Saxon economy,
- ❑ facing the challenges, especially in SOFC technology, in order to enhance the economic strength of Lower Saxony in this field lastingly,
- ❑ channelling the research capacity, especially at the location Clausthal-Zellerfeld, and establishing close cooperation with further enterprises of the regional industry, and
- ❑ determining and preparing the applicable promotion programs on the regional, the national, and the European level, in order to develop and to seize as many promising project proposals as possible, as well as to ensure their success.

CUTEC has already acquired the first project promoted by the Fuel Cell Initiative in Lower Saxony, the installation of an SOFC demonstrator for liquefied petroleum gas, together with H. C. Starck. (di)



Participants and locations of the Fuel Cell Initiative in Lower Saxony

Signing of cooperative agreement with Malta

CUTEC is supporting the Maltese Government in ecological modernisation

During the past summer, the Maltese Ministries for Infrastructure and Resources as well as for Environment and Agriculture have signed a cooperative agreement with CUTEC: The Institute will support the Maltese Government in the implementation of comprehensive ecological modernisation and of a national strategy for sustainable development. The background for the cooperative agreement is the necessity of transposing the environmental standards of the European Community into Maltese national law.

Nine out of ten Maltese live in cities;



The highest elevation on Malta: the Maghtab landfill (photograph: Lessing)

Malta is thus the most densely populated country in the European Community. Especially because of the high traffic volume, Malta is faced with enormous problems of air pollution. For electric power generation, Malta is completely dependent on imports of fossil fuels, especially oil. The potential offered by renewable energy sources, such as sun and wind, has not yet been exploited. The drinking water supply as well as waste-water treatment present further major challenges. Moreover, solid-waste disposal is a very serious problem in Malta, since the limited capacity of landfills on the island has been exceeded.

Within the framework of the cooperative agreement, „Towards Sustainable Malta“, innovative projects should therefore be initiated in the fields of water, waste, and energy. Thus, the Maltese Government strives to set a role model of sustainable environmental protection in the southern Mediterranean area with the assistance of German environmental technology.

For the coordination of this project, a German-

Maltese steering committee has been appointed. The group comprises the Minister of Resources and Infrastructure, Mr Zammit, the Minister of Environmental Protection and Agriculture, Mr Pullicino, as well as Prof. Heins, Head of the Department of Environmental Economics and Law Technology Assessment.

For CUTEC-Institut GmbH, support and realisation of sustainability strategy for Malta constitute a major chance which exceeds by far the adaptations necessary for satisfying the existing European environmental standards. In particular, an integrated approach and concept should be ensured, with due participation of all stakeholders in the process of sustainable development.

With a total area of 300 km², Malta is the smallest member country in the European Community. Fewer than 400 000 inhabitants live on the island group between Sicily and Tunis, whereas some 1 200 000 tourists visit the islands annually. Rather than extensive beaches, a fascinating feature of Malta is the diversity of cultural heritage; almost all European and several Arabic cultures have inhabited this country, and their traces are evident everywhere. Besides tourism, the main sources of revenue include producing industries, shipyards and, to an increasing extent, service industries. (hem)

Major Accident Commission of the German Federal Government is guest at CUTEC

Round of experts convenes on questions of risk management

Prof. Heins, department head at CUTEC and member of the Major Accident Commission (SFK) for the past three legislative periods, invited this top-class board to CUTEC in Clausthal for its 47th meeting at the end of September 2004.

Since its establishment in 1992, this commission has counselled the German Federal Government, subordinate authorities, as well as the European Union on questions of plant safety. As a functional unit of the German Federal Ministry of the Environment, Nature Conservation, and Nuclear Safety, the board indicates possibilities for improving plant safety at regular intervals and on special occasions. The members of the board include specialists from highly diversified fields: Besides representa-

tives from science and industry, various social groups, such as environmental organisations and trade unions, as well as TÜV, are present. In addition to the

closed session of the commission, CUTEC presented concrete projects and reached agreements on closer cooperation at various levels. (kra)



Members of the Major Accident Commission

CUTEC trains top officers from Akwa Ibom State, Nigeria



CUTEC team welcomes Akwa Ibom State Trainees in Germany

The deteriorating environmental situation in most major cities of Nigeria motivated CUTEC to initiate negotiations for long-lasting and sustainable solutions for safe environment in Nigeria. It was also discovered that environmental development is at its infancy in Nigeria like in any other developing countries of the world. Most political leaders still do not appreciate the importance of safe environment and the consequences of polluted environment to human life and nature. Consequently, the present Federal Government of Nigeria has laid strong emphasis on the protection and development of the environment. Akwa Ibom State is one of the few states where the environment is given the deserved attention. After series of meetings and tours, the CUTEC team submitted a detailed proposal on integrated solid waste management to the government of Akwa Ibom State which was later approved by the Executive Governor, Arc. (Obong) Victor Attah, a Nigerian with high integrity, excellent vision and dedication to duty.

It was deemed very important to commence such a pioneer project with a training programme for selected officers from the state. Hence, the Akwa Ibom State delegation was trained at CUTEC facility in Germany from 28th June to 8th July 2004. The trainees were Mr. Alphonsus Essien (Head, Waste Management Division), Mrs. Comfort Asuquo (Head, Laboratory Services Division), Mr. Joseph E. Asuquo (Head, Education / Public Awareness) and Mr. C. T. Okoro (Asst. Head, Waste Management Division). Dr. Ekpeme Udom was specially invited by CUTEC to participate at the intensive training to ensure continuity and effective local representation. The delegation was warmly welcomed by CUTEC' Managing Director, Prof. Otto Carlowitz and his top managers.

In his opening speech, Prof. Carlowitz reminded the trainees about the excellent relationship that exists between CUTEC and the government of Akwa Ibom State. The Governor has long indicated understanding and high priority for safe environment in his state. Further in his speech, Prof. Carlowitz introduced CUTEC as an applied environmental development company which mainly develops practical and hands-on technologies and processes for environ-

mental solutions. He reiterated the urgent need for an effective environmental waste management system in Akwa Ibom State and assured that the people of Akwa Ibom State would always appreciate CUTEC's environmental services. The CUTEC team promised to maintain the good relationship and trust anytime and anywhere.

The training programme in Germany intimated the Akwa Ibomites with the major components of waste management and landfill development in Germany. CUTEC intends to establish similar system in Akwa Ibom State to suite the local situations. The theoretical sections of the training programme entailed Waste Logistic, Mechanical and Biological Waste Treatment, European State-of-the-Art in Landfill Construction Technique, Lasting Solutions for Contaminated Grounds and Waste Treatment, Environmental Protection / Control, Geographical Information Systems (GIS) in Waste Management, Landfill Leachate Treatment Techniques, Integration of Geographical Data for Environmental and Infrastructure Planning, Environmental Analysis, etc while the practical field exposure took place at Waste Logistic Department in Clausthal City, Berlin Landfill Facility, Hannover Landfill Facility, Kohlenfeld Landfill, Toxic Waste Disposal Site at Hoheneggelsen, Waste Transfer Station at Holzminden and Hattorf Leachate Water Treatment Plant. There was a tour of the entire CUTEC facility.

Highly respected CUTEC environmental experts lectured and participated at the theoretical and practical sections respectively. Amongst the experts were Prof. K. Thomé-Kozmiensky, Prof. von Dierkes, Engr. M. Struve, Dr. T. Zeller, Mr. W. Steib, Dr. F. Taetz, Dr. D. Hermsmeyer, Dr. K. Schrickel, Dr. M. Sievers, Dr. T. I. Onyeche and Engr. W. Siemers.

At the closing ceremony, the CUTEC management praised the Akwa Ibom State delegation for the active participation and profound interest during the training. Proper waste management keeps the environment clean, prevents health hazards, creates jobs, improves standard of living, generates revenue, inculcates discipline, alleviates poverty, creates basis for future generations, and so on. Developing countries should not repeat the mistakes industrial nations made which today cost billions of Euros with bitterness. Prof. Carlowitz further advised that Akwa Ibom State urgently requires an effective environmental awareness programme, modification of the existing waste logistics and transfer stations, establishment of a waste stream studies, environmental studies, exposure to international activities, more training, professional environmental consulting, and so on. There should be integration of environmental factors in every human activity in Akwa Ibom State and Nigeria as a whole. Governor Attah of Akwa Ibom state was highly praised for initiating such a unique and sustainable waste management programme under the supervision of highly respected group like CUTEC. The great Governor Attah has set the pace for Africa and especially Nigeria.



The trainees thanked the CUTEC management for the first-class training and the wonderful hospitality in Germany. They admitted that the training really exposed them to the world of environment and its values and wished that more Nigerians, especially from Akwa Ibom State, could also benefit from such a unique training for better environment in Nigeria. The delegation was excited about CUTEC's facilities and capabilities as well as standards. There was great satisfaction for the choice of CUTEC as the Principal Environmental Consultant/Adviser to the Governor of Akwa Ibom State, Nigeria. (on)

Wasser + Gas Berlin 2004

CUTEC presents innovations for waste-water treatment

The industrial fair, Wasser + Gas Berlin, is one of the leading exhibitions of its kind in Europe. This year, the special exposition, Wasser + Gas Berlin Spezial, was held from 8th to 10th September 2004 for further consolidating and intensifying economic relations between the countries which have recently joined the European Community and the Western European nations.

For intensifying CUTEC's international position in the field of waste-water technol-

ogy and treatment, CUTEC was represented with a stand of its own at this important exhibition. The CUTEC presentation was focussed on the field of municipal waste-water treatment. The primary purpose of this exhibit was to inform the well-versed, specialised visitor of the potential for optimising the process chain, biology – sludge digestion – dewatering. The CUTEC stand received much attention during the three days of the fair. (schr)

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Nigerian Ambassador visits CUTEC Institut GmbH

In his welcome speech, Prof. Carlowitz thanked his guest for the august visit and expressed his gratitude for the Embassy's good relationship with CUTEC which started during the time of the late Ambassador Echeruo. Prof. Carlowitz re-assured the Ambassador of CUTEC's profound interest in ensuring safe environment in Nigeria with most appropriated and adapted environmental technologies and services for sustainability and continuity. He also informed the Ambassador of the very successful training programmes organised at CUTEC facility for two Nigerian delegations from the Ministry of Federal Capital Territory (MFCT), Abuja and Akwa Ibom State government in December 2003 and June 2004 respectively. Such practical training is very crucial for the realisation of an effective transfer of technologies and strategies with sustainability and continuity. CUTEC lays emphases on local skill development and technical/managerial exposures for local manpower.

The meeting of CUTEC delegation with President Obasanjo of Nigeria and some of his ministers was also stated. Prof. Carlowitz praised the interest of the present Nigerian government in safe environment and also wishes that the on-going reforms in Nigeria continue for better economy and standard of living in the great nation. He re-iterated that the CUTEC team wishes to make Nigeria a model but hopes to be given the mandate for operation. The dynamism of both President Obasanjo and the Honourable Minister Mallam el-Rufai of MFCT were also noted. He specially praised the Executive Governor of Akwa Ibom State, Arc (Obong) Victor Attah for the developmental foresight and sustainable programmes for his state. Governor Attah is still the only Nigerian Governor that embarked on sustainable waste management programme with world-class landfill

development for his people, of course with CUTEC as his principal consultant. Prof. Carlowitz was happy to have Prof. Adeniran, also a well-respected Nigerian, as the first Nigerian Ambassador to visit CUTEC.

In his response, Prof. Adeniran expressed delight at the opportunity to visit the great institute. He informed that prior to his arrival in Germany as the Nigerian Ambassador, he had been aware of the activities and reputation of CUTEC and the role it plays in enhancing human existence. As a former member of cabinet and presently an envoy, he noted that he could very well vouch for President Obasanjo's absolute commitment to the development and protection of the environment. According to Ambassador Adeniran the new focus on the Federal Capital City (FCT) and major cities in Nigeria as well as the creation of a Federal Ministry of Environment is a testimony of that concern by Mr. President for the environment and for the creation of a sound and healthy nation.

The Ambassador observed that the institute had the technical competence and requirements for solving Nigeria's myriad environmental problems and that the presence of a Nigerian in the person of Dr. T. I. Onyeche within the hierarchy of the organisation is also a positive development that would generate confidence in the services



The Nigerian Ambassador inspects a landfill model in CUTEC

FEE meets at CUTEC

The Fördergesellschaft Erneuerbare Energien (Abbr.: FEE, Berlin – Foundation for Renewable Energy) represents the interests especially of small and medium-sized institutions in the field of regenerative energy sources. On 13th September 2004, the working group, "Gasification of Biomass" convened with an extraordinarily large number of guests at the CUTEC Institute. After the welcoming address by Dr. Grieße from the Ministry of the Environment in Lower Saxony and Prof. Carlowitz, speakers described developments in various technological fields and discussed economic considerations. After a prognosis for the future by the Chairman of the Board, Mr Eberhard Oettel, the long day of discussion was concluded by a visit to the ArtFuel plant. (vd)

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rendered by CUTEC in Nigeria. He promised to liaise appropriately so as to ensure the eventual take-off of the institute's programmes for Nigeria. The Ambassador also indicated the possible assistance from CUTEC in obtaining counterpart funding from appropriate institutions in Germany and elsewhere, for states who wish to benefit from their programmes but which may not be able to bear the full costs involved.

A tour of CUTEC facility followed after the meeting which also intimated the Ambassador with the operations in the laboratories, mechanical/electrical workshops, plant demonstration halls, library, communication/computer department, solid, liquid and gaseous waste treatments, and so on. Ambassador Adeniran concluded by re-iterating that CUTEC-Institut had a lot to offer Nigeria and that the country was happy to be in partnership with the organisation. (on)

Scientific Advisory Board at CUTEC:

Dipl.-Ing. Stephan Röthele: a personal profile

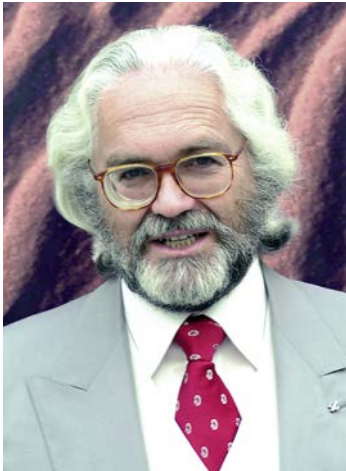


Photo: Sympatec

Dipl.-Ing. Stephan Röthele

Since 1988, Dipl.-Ing. Stephan Röthele has been Managing Director and partner at Sympatec GmbH System-Partikel-Technik, which celebrated its 20th founding anniversary with its move to the „PULVERHAUS“ on historical mining premises in Clausthal on 1st October 2004. After completing his diplom in 1971 at the University of Karlsruhe (TH), where he majored in chemical engineering and then concentrated on particle technology, he came to the Technical University of Clausthal in the „wake“ of Professor Leschonski in 1972. He held the post of *Oberingenieur* (Chief Engineer) for many years at the Institute of Particle Technology, which had evolved from an independent department at the Institute of Mineral Processing. During the following years, Mr Röthele has also served as scientific project leader in the course of three major projects involving new classification technology in practical applications at BMFT, with special emphasis on the recycling aspect. His pronounced orientation toward practical applications resulted in the establishment of an engineering office as well as several individual companies, and finally culminated in the founding of Sympatec GmbH System-Partikel-Technik, where all business

activities were concentrated. The successful technology transfer from the Technical University of Clausthal was honoured with the awarding of 1st prize by the Chamber of Commerce in Braunschweig (dry dispersion) in 1985 and that from the German Federal Minister of Education and Science (on-line particle size analysis) in 1986.

Mr Röthele was appointed to the Scientific Advisory Board upon recommendation by the founder of CUTEC, Professor Leschonski, with whom he had already gained intensive experience in environmental research within the scope of the waste management program of the German Federal Government in the latter half of the 1970's. During this period, he actively supported Professor Leschonski

in the efforts which preceded the establishment of CUTEC, until he became independent in the mid-1980's.

In his opinion, the CUTEC objectives for the future can be concentrated on the active promotion of „emergent sustainability“ through the interdisciplinary application of systems technology for the present generation, above and beyond the current trends in environmental engineering.

For achieving these objectives, he offers suggestions during the meetings of the Advisory Board. „For this purpose, I try to identify clear-cut contours in the triad consisting of strategy, planning, and identity. From an operational standpoint, of course, it is clear that priority must still be assigned to those projects which are feasible in the short term at CUTEC“. (he)

New male quartet in the CUTEC team

For the first time: Two trainees in the workshops



From left: Ralph-Uwe Dietrich, Thomas Albert, Michael Dreilich, and Martin Bröhl

Since 1st October 2004, Dipl.-Ing. Ralph-Uwe Dietrich has been supporting the competence node, „Science and SOFC Development“, of the *Landesinitiative Brennstoffzelle* (Fuel Cell Initiative in Lower Saxony), whose business office at CUTEC has recently opened. (See our report on page 2.)

Mr Dietrich completed his studies in process engineering at the Technical University of Leuna / Merseburg (TH), where he received the degree of Diplom-Ingenieur. He has come to us from Invensys Systems GmbH (automation technology), where he occupied a wide variety of positions in such fields as project development and project management, as well as marketing, sales, and distribution.

Since 1st September 2004, Thomas Albert has been employed as a technician in the Department of Thermal Processes.

After completing his training as an electronics technician for power systems at the Preußen Elektra power station in Würgassen, Mr Albert was employed for several years as a plant electrician at various companies. During this period, he continued his education by way of correspondence courses. Upon completion of these courses, he received the title of state-registered electronics technician with special concentration in the field of information electronics. At CUTEC, Mr Albert is responsible for the measuring and control technology of the process-control system for the thermal facilities.

For training as an industrial mechanic and as an electronics technician for plant technology, respectively, Martin Bröhl and Michael Dreilich have begun their service at our institute as of 1st August 2004. (he/wes)

DATES:

- ❑ CUTEC presentation at IFAT 2005 14th International Exposition for Water, Waste Water, Solid Waste, Recycling from 25th to 29th April 2005 in München